Serial No.: 10/248,967
Confirmation No.: 4437
Applicant: BODIN, Jan-Olof *et al.*
Atty. Ref.: 07589.117.PCUS00

REMARKS:

Applicant has amended the specification by deleting the text "**BACKGROUND OF THE INVENTION**" at the end of paragraph [0001].

Applicant has amended claims 1, 8, 9, and 10. Claim 1 has been amended to make "channel" plural thereby obviating the objection of the Examiner. Applicant gratefully acknowledges the indication of allowability for claims 2-4, 6, and 7 and the indication of the allowability of the subject matter of claims 8-10.

IN RESPONSE TO THE OFFICE ACTION:

REJECTION UNDER 35 U.S.C. § 112:

The Office Action states that claims 8-10 are rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Applicant has amended these claims to clarify the relationship of the walls and sheet metal. Applicant respectfully submits that these claims are now in condition for allowance.

REJECTION UNDER 35 U.S.C. § 102:

Claims 1 and 5 are rejected under 35 U.S.C. §102(b) as being anticipated by Stöckel (U.S. 3,154,914). Initially, it is instructive to review Applicant's recitation in claim 1 (as amended) which reads:

> 1. A liquid fuel rocket engine member (10) comprising: a load bearing wall structure (11, 14) comprising a plurality of cooling channels (11) for handling a coolant flow, wherein the load bearing wall structure (11,14) comprises a curved wall (14), and wherein a wall of each of said cooling channels is attached to said curved wall; and each of the cooling channels (11) having a flow guiding surface (15,16,17,19) extending at an angle to the cooling channel axis and thereby providing the axial coolant flow with an added radial directional flow component.

The protruding ribs 15 of Applicant's Fig. 2 (see below) exemplify such a recited flow guiding surface that extends at an angle to the cooling channel axis (indicated by the right-pointing arrow in the middle of the figure). Fig. 3 demonstrates the added radial directional flow component that is provided to the axial coolant flow through the cross-sectionally rotational flow exhibited therein (see circulation arrows in the middle of that figure).

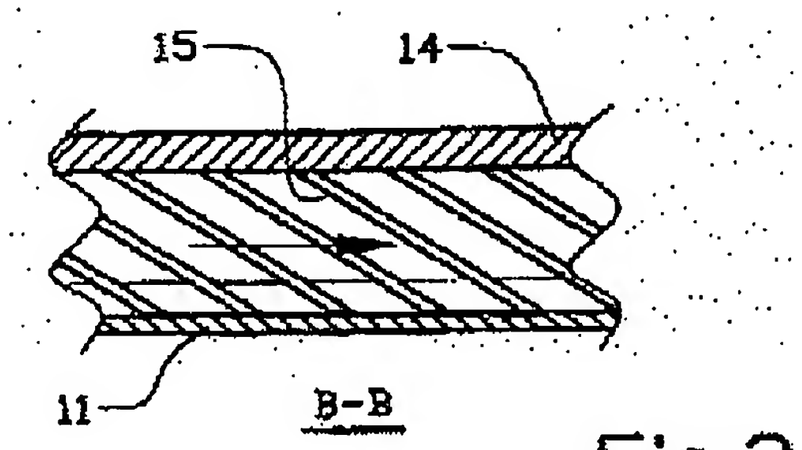

Fig.2

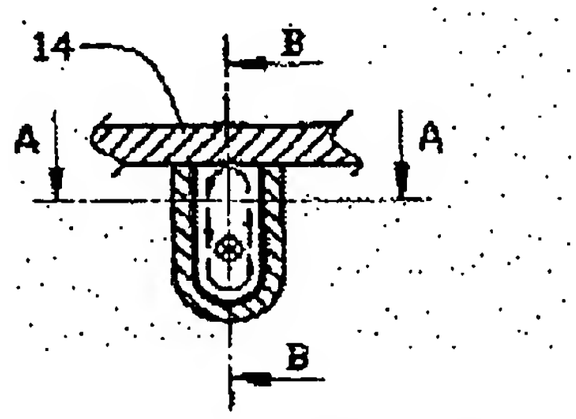

Fig.3

APPLICANT'S FIG. 2

APPLICANT'S FIG. 3

The Action states:

> "Stöckel discloses a liquid cooled rocket nozzle having a wall (Fig. 1) made up of curved wall (11) and plural cooling channels (14) each having a flow guiding surface (28, Figs. 4a-d). As can be seen in Figs. 4a-d the flow guide directs the cooling liquid at the radially outer part of the channel radially inwards as the fluid flows along the cooling channel."

It is respectfully asserted that this does not accurately describe the arrangement of Stöckel. To that end, Stöckel's Figs. 4a - 4d are provided below for ease in reference.

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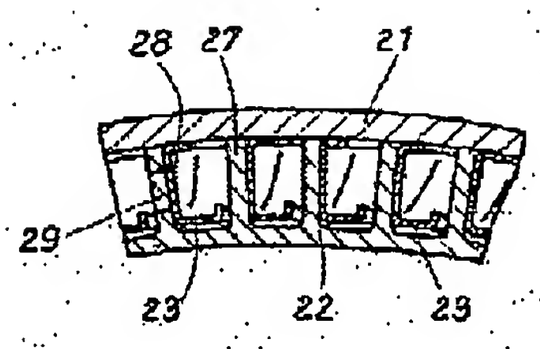

Fig.4a

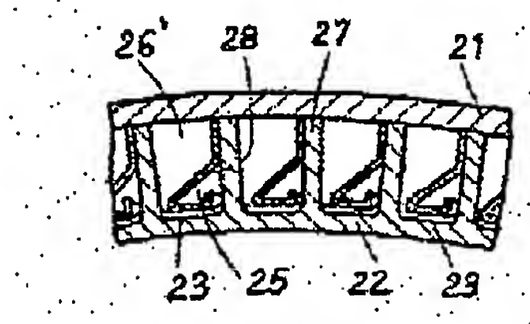

Fig.4c

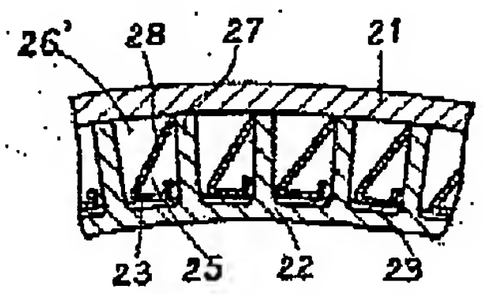

Fig.4b

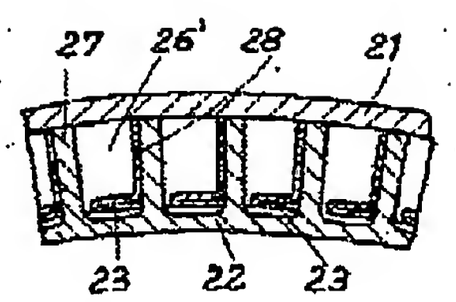

Fig.4d

The corresponding description is found at column 5, lines 12-43, duplicated below:

In the embodiment indicated in FIGS. 4 and 5 which is particularly suitable for large sized rocket engines with high capacity and output an inner wall 22 is provided with radially spaced outstanding ribs or webs 27 which are connected into an outer wall 21 by means of a dovetail fit. The webs 27 form feeding channels 26 in longitudinal direction, the inner faces of which are provided with cross cooling channels 24 defined between the shortened webs on partition elements 23. These cross cooling channels are of a length which corresponds or conforms to the width of the feeding channels 26 and liquid is directed therethrough in a tangential direction. Due to the invention the width of these cross cooling channels 24 should be not larger than the radial extension of the cross cooling channels and less than 2 mm.

In this construction fluid flow to the auxiliary cross channels 24 is adjusted in magnitude by means of guiding plates 28 which are arranged in the channels 26 dividing the same into inlet channels 25 and discharge channels 26'. The guide plates 28 are shaped in such a manner that the channel 25 becomes constantly narrower along its length while the channel 26 becomes correspondingly wider. This is indicated in FIG. 4 by the different cross-section taken at *a* through *d* of the guide plate 28 corresponding to the sections in the various planes *a* through *d* in FIG. 5.

With the construction as indicated in FIGS. 4 and 5 the extent of the constriction or widening of the channels 26 and the flow through the cooling channels 24 may be exactly determined. Openings 29 between the inlet channels 25 and their respective adjacent discharge channels 26 make sure that there is a compensation and thus that there is uniform flow.

From the Stöckel description and figures above, it is clear that what is disclosed are partition elements 23 and guide plates 28 that divide the channel 26 up into inlet channels 25 and discharge channels 26'. It is explained that the guide plates 28 are shaped in such a manner that the channel 25 becomes constantly narrower along its length while the channel 26 becomes correspondingly wider. There is no disclosure (either express or inherent) of "cooling channels (11) having a flow guiding surface (15,16,17,19) extending at an angle to the cooling channel axis and thereby providing the axial coolant flow with an added radial directional flow component" as recited by Applicants in claim 1.

In view of the discussion above, Applicants respectfully submit that claim 1 is not anticipated by Stöckel and is therefore allowable.

Claim 5 depends from claim 1 and therefore is respectfully asserted as being allowable for the same reasons.

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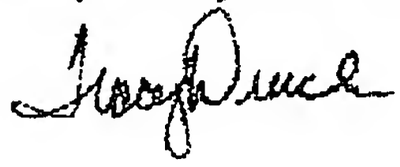
The undersigned representative requests any extension of time that may be deemed necessary to further the prosecution of this application.

The undersigned representative authorizes the Commissioner to charge any additional fees under 37 C.F.R. 1.16 or 1.17 that may be required, or credit any overpayment, to Deposit Account No. 14-1437, Order No. 07589.117.PCUS00.

In order to facilitate the resolution of any issues or questions presented by this paper, the Examiner should directly contact the undersigned by phone to further the discussion.

Respectfully submitted,



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